DOCUMENT RESUME

ED 106 194 SO 008 330

TITLE	Futures Information Interchange Newsletter; Volume 3, Number 2 and 3, December 1974 and April 1975.
INSTITUTION	Massachusetts Univ., Amherst. School of Education.
PUB DATE	75
NOTE	35p.; Two issues of newsletters are combined, n2 and n3
EDRS PRICE	MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS	Ecology; Elementary Secondary Education; Environmental Education; *Futures (of Society); Games; *Learning Activities; *Newsletters; Population Growth; Simulation; Social Change; Social Sciences; Social Studies

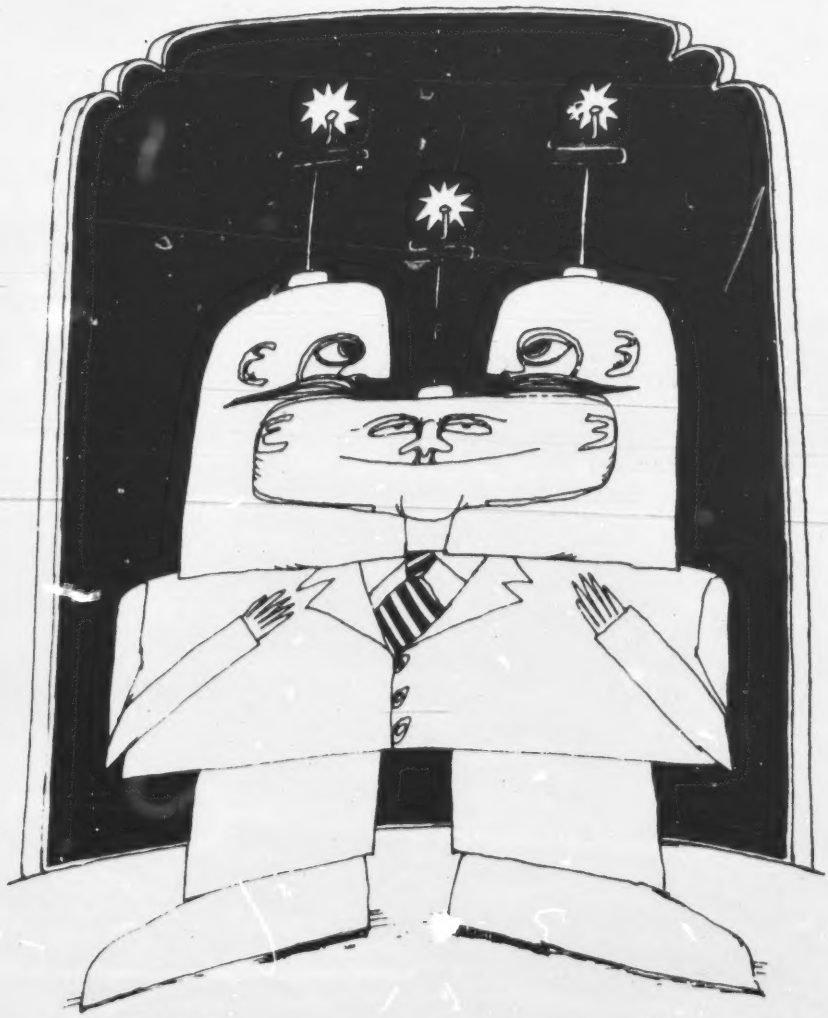
ABSTRACT

The Futures Information Interchange Newsletters (No. 2 and 3) include a collection of practical teaching methods and learning activities for introducing future studies in the elementary and secondary classroom. Two lead articles offer new insights into future studies. In "Dilemmas of a Futurist" Fran Koster discusses some of the stresses unique to futuristics practitioners. Jake Plante in "Images of the Future and Their Educational Significance" urges educators to recognize that a greater future time perspective has a positive effect on life in the present, i.e., future imaging relates to the here and now. Additional articles are included on a cross-impact matrix which is a planning technique for determining the mode and impact of relations between sets of information or events, a model for classroom exploration of community futures, simulation games in the classroom, and guidelines for using the Delphi method. Class exercises, bibliographies, questionnaires, games and simulations are provided on various topics, such as population, ecology, and energy, in order to give teachers and students materials and ideas to work with on future studies. (JR)

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED106194

futures information interchange



SP 008 330

FUTURE STUDIES
PROGRAM

SCHOOL OF EDUCATION
UNIVERSITY OF MASSACHUSETTS

00002

The Futures Information Newsletter is a collection of practical teaching methods and learning activities for introducing future studies into the classroom. Although the newsletter is directed toward primary and secondary school teachers, it is intended to be of value to educators at the pre-school and university levels also.

****

Because the FII Newsletter is a no-cost publication we have no means for updating our subscription mailing list. We ask, therefore, that you please fill out and return the enclosed questionaire (see page 13). Your recieving of future publications is dependent upon the simple return of this questionaire.

The Future Studies Program is searching for interested undergraduate and graduate students for admission into the Program this September 1975. (apply through the University) We are also looking for a faculty person to direct our Program next Fall. (Submit vita to address below.)

Vol. III No. 2 December 1974

Future Studies Program

School of Education Hills House

Rm. 166 University of Massachusetts

Amherst, Mass. 01002

CONTRIBUTORS:

Duane Dale
Cyndy Guy
Elaine Harding
Mark Cherniack
Fran Koster
Al Peakes
Jake Plante

DILEMMAS OF A FUTURIST

by Fran Koster

As a teaching futurist, I have the responsibility to read widely in the frontiers of several fields and to contemplate the implications of many recent developments. I'm finding it of considerable difficulty to do this well in the face of enduring skepticism, derision and outright dismissal by citizens, peers and colleagues.

Last month I read a book on some recent advances in Biology, which discussed some of the ethical and moral implications of these advances. About the same time, I read of a recent effort at serious research in ESP, and the alleged ability to influence this phenomenon by altering one's diet. I tried to talk of the stunning potential for abuse these two areas of research pose for our society with a generally intelligent and thoughtful friend. He laughed at me. His laughter, which stung, set me to thinking, and I made a list of some of the stresses unique to practitioners in the field of futuristics.

First off, a good futurist must read widely, not only the literature of his own field, but the literature of perhaps ten other fields as well. It is simply exhausting, expensive, and leaves me, for one, feeling as if I never finish anything. Once having read widely, and cognizant of some basic thrust shaping our future, a futurist must in many cases discuss unpleasant information. The information, in and of itself, may not be unpleasant, but if it represents a new way of doing things, or a possible change in the way people are accustomed to doing things, many people will regard it as bad. One's reception, when delivering this kind of information is not always pleasant and, of course, if the information is in fact bad the reception becomes worse. The personal cost

to me lies in the fact that no one likes to be treated as a persistent source of bad news. I do not wish to become a professional pessimist.

Once going public with some perceptions, often grounded in several disciplines, one runs the risk of being confronted with a subject matter specialist of a rather narrow field, who can go on and on in the subject of his depth, about less and less, in the process making the futurist look ignorant or ill-informed. Try talking about the global energy implications of Agro-business (Dependence on Hydro Carbon fertilizers) with an audience which contains a botanist sometime.

A good futurist must decide to suspend disbelief, to actively consider a range of possibilities and phoenomena most serious people would discard as unworthy of debate. The painful part of the process comes when one raises the possibility of some unlikely or unanticipated phenomenon to a public audience. I remember mentioning electro-agriculture (which is the influencing of plant growth by subjecting the plant to various electromagnetic frequencies) at a seminar on population and food. Never have I been so effectively belittled, nor felt so impotent. Afterwards, some delegates approached me to offer their condolences at the way I had been treated, but even these kind folk would not take the fifty-year-old, well documented idea seriously. Most people are simply not attuned to notice how commonplace revolutionary changes in society's organizations have become, and resist any efforts to be changed.

The last stress, and perhaps the most difficult, is that one's personal lifestyle is subject to attack. Last week I spoke to a junior high school about the future. As is my habit, I discussed some restraints on the future options which result from past actions, e.g., DDT in the food chain, the Malthusian dilemma of food and population, the disproportionate share of the world's resources consumed by the United States, and so forth, before going on to some likely scientific and social connotations. The question and answer

period afterward was vicious: How many children do I have? Do I believe in or practice abortion? How did I travel to the school to lecture? Would I let my family starve to feed some savages? Do you practice what you preach? I am afraid I did not do very well at fielding these questions. I am not now sure I can answer them definitely, even to myself. I am left with the certain knowledge that I must continue trying.

The professional training grounds of futurists today lies primarily in the universities. Universities teach, among other things, a form of personal behavior: a suave, mildly restrained, wry attitude toward mankind's universal foolishness. To be emotional, or single-minded is to be perceived as professionally unfinished, or mildly embarassing, like a slight drunk young wife at a faculty reception. If Paul Revere rode his horse through the groves of academe, shouting his warning, chances are he would be dismissed as an alarmist, or denied stable space the next time resources were being passed out. Teaching futurists are, by definition, alarmists. Thus, the environment which is supposed to nurture one is subtly at odds with your comfort.

I guess what I am trying to say is that being a futurists is harder than I ever thought possible, and because I believe this mode of inquiry is absolutely essential to the world of tomorrow, I hope we as a profession find some way of dealing with these stresses.

- Robert Frost -

Two roads diverged in a yellow wood,
And sorry I could not travel both
And be one traveler, long I stood
And looked down one as far as I could
To where it bent in the undergrowth;

I shall be telling this with a sigh
Somewhere ages and ages hence:
Two roads diverged in a wood, and I -
I took the one less traveled by,
And that has made all the difference.

Cross-Impact Matrix

Jake Plante

The cross-impact matrix is basically a planning technique for determining the mode and impact of relations between sets of information or events. However, matrixing can be classified as a forecasting method when it is geared to future-time through the cross-reference of trends.

Matrixes or "grids" are used effectively as a means of organizing, classifying, and storing data. (e.g. R. B. Fuller's World Game). Subsequently, they may be used as the basis for construction of future scenarios, games, or simulations of existing systems.

As with other forecasting methods, the matrix can be as sophisticated and complex as the designer wishes. The use of computers in matrixing makes it possible to process vast amounts of information and to generate multi-level relationships and time lag factors for when the relationship will be felt. For most purposes though, the cross-impact matirx is more valuable for the insights it provides rather than the actual values it produces.

Introducing the Matrix

One way to proceed would be to have students identify major trends by building futures wheels (see October '74 issue of newsletter). Then, have the students transpose their wheel "hubs" into the parameters of the matrix.

Determining what set of trends to compare depends of course upon the nature of the subject under study. Likewise, the goal of the exercise may be researching complex associations between related trends or else exploring possible interrelationships between trends of a seemingly different character. Most teachers find the exercise more educational and revealing in the former role where surprising outcomes are boundless.

Actual measurement can be in the quantitative or qualitative mode.

Several variations are:
a. 1 - 10 scale
b. -2 -1 0 +1 +2 scale
c. + or -
d. descriptive statements
e. pictures

(note: "negative" or "minus" would denote less value or effect, "positive" or "plus" would denote greater value or effect)

How to read the matrix: At each block ask, "how does the Trend effect the Variable?" (e.g. a.2 - "how do less cars effect prices?" Less auto production means a decline in the U.S. economy and greater unemployment as a result)

Below are two completed variations of the cross-impact matrix.

VARIABLE -	CARS 1	PRICES 2	ENERGY 3	POPULATION 4	COMMUNAL LIVING 5
TREND a LESS CARS	*	U.S. economy declines more unemployment	save energy	People move back to cities from suburbs	push toward greater self sufficiency
b RISING PRICES	fewer cars because most people can't afford them	*	more energy production because of greater profits	less people because children are percieved as being uneconomical	more home gardens, cooking, + "do-it-yourself" stuff
c CONTINUED ENERGY SHORTAGES	fewer cars because no fuel at stations	cost of almost everything goes up	*	oil-base fertilizer shortages cause starvation	more sharing of what is available - some alt. energy sources practical only at this level
d INCREASING POPULATION	demand for cars increases: more cars or mass transit	greater demand means higher prices	less energy for each person	*	more intentional communities
e MORE COMMUNAL LIVING	people share rides fewer autos	material sharing + large wholesale orders keep prices down	more efficient use of energy helps ease shortage	lowers indirectly by better educating its people to the problem	*

- less of value
+ more of value

TREND	SOCIAL VALUES - Strength of family unit	Quality of the environment	Stability in our lives	General material and social standard of living	Social responsibility	Dependency	Privacy
Increased mobility	-	-	-	+	+	+	
More complete systems of communication	+ -		+ -	+	+	+	-
Greater pollution		-	-	-	+	+	-
Growing Middle East conflict	-	-	-	-	+	+	-
Higher rate of change	-	-	-		+	+	-
Increasing population		-	-	-	+	+	-

YOURTOWN TOMORROW: AN EXPLORATION OF LOCAL FUTURES

Duane Dale

The forecasting done by groups such as California Tomorrow, Massachusetts Tomorrow, and Hawaii 2000 provides an exciting model for classroom exploration of community futures. These groups examine the most likely and most desirable future alternatives on a statewide level; the application of their approach on a local level by students is straightforward and rewarding.

The California Tomorrow Plan (available commercially in paperback) follows a simple outline. California Zero is the present state of affairs, including both the strengths and weaknesses of the state. California One is a "business-as-usual" forecast: present trends and policies are projected to the year 2000. California Two is an image of a better future which might result through a wise choice of new policies. A classroom unit which follows this outline will include several key elements of futuristic education: analysis of social realities, extrapolation of numerical and non-numerical data, creative

exploration of alternative possibilities, assessment of the impact of these alternatives, and clarification of values.

The "Tomorrow" and "2000" projects identify important elements of a social forecast, such as population, land use, housing, jobs, transportation, water, energy, health care, education, and recreation. When a group of Nantucket teachers in an in-service futuristics course did a "Nantucket Tomorrow" exercise, they brainstormed a list of topics which were important on the island. It was possible to come up with 14 topics for the 14 teachers, so each member of the class researched the present situation, likely future, and alternative possibilities for one topic.

Newspapers, government reports and documents, and personal interviews with town fathers (and mothers!) were the most useful sources of information. At the beginning of the research, teams of three or four students helped each other to identify the key questions to be answered by their research. The teams met again mid-way through the assignment to examine preliminary findings and suggest additional sources of information.

An important part of such an exercise is the integration of individual topics into a composite view. The cross-impact matrix is a useful tool here; students could be encouraged to speculate and develop theories about the interaction among population, job opportunities, and housing, for example. A variety of other forecasting techniques can be included in the exercise; the Delphi technique for obtaining likelihood and time-frame data on local possibilities could be especially helpful.

The exploration of alternatives (Yourtown Two) is the most important, and probably the most difficult aspect of the exercise. Most communities have an image--often unspoken, but sometimes available in planning documents--of what the future will be like. That is Yourtown One. Yourtown Two involves going beyond such popular impressions through brainstorming, "What if..." exercises (... your town was destroyed by an earthquake--noone hurt--and you were assigned to replan it from the beginning), and other creative thinking techniques. Science fiction, the Whole Earth Catalog, and other material on technological and social alternatives can help to stimulate open-minded thinking.

A variety of teaching aids can be used to develop understanding about communities and community process. Board games (e.g., "Newton," "Smog," "Dirty Water") and simulations of community decision-making will give insight into the way that policy ideas are created and put into play. Appearances by town leaders or visits to local planning agencies may be useful in gathering information, and could also encourage such officials to do some long-range thinking.

A group of students who have done a good job at exploring community possibilities deserve a wider audience than themselves and their teacher. A booklet, a display in the public library, a presentation before a town meeting, or a column in the local newspaper--the possibilities are varied. The "Nantucket Tomorrow" project produced a 60-page booklet. As an illustration of the type of information that can be generated by such a project, an abstract of the report is attached.

NANTUCKET TOMORROW: SUMMARY OF A REPORT
BY MEMBERS OF THE COURSE, "FUTURISTICS FOR
THE CLASSROOM" - MAY, 1974

Nantucket Zero. A building boom is adding to the slow but steady growth of year-round population and the rapid rise of summer tourism. Aging physical facilities in such areas as education, sanitation, and water supply are matters of community concern. Concern about land use and open space comes from the mainland as well as the island; Senator Kennedy's bill appears to be the most likely solution to these problems. Researchers were surprised by the lack of long-term planning in certain areas, such as energy supply.

Nantucket One. By 2000, the Kennedy bill has been enacted, preserving large areas as open space or at present levels of use. The building boom is over, leaving 39% of the island undeveloped, but perhaps as many as 5500 housing units have been added to the present 3300, dividing some 44% of the island into new 2 1/2 acre lots.

The Kennedy bill's proposals for job development are largely unsuccessful, and the end of the building boom forces a number of year-round residents to relocate on the mainland. The economic gap between summer and year-round residents is increasingly evident. Air and water pollution are not problems; the amount of fresh water available has been determined by a study done in the late 70's. A number of breakdowns in the sewer systems forces the improvement of facilities. Erosion of certain coastline areas by wind, water, and the action of off-the-road vehicles continues despite sporadic attempts to correct the problem.

Nantucket Two. The island, or certain parts of it, are restricted to bicycles. Restoration to the Nantucket of whaling days has secured Nantucket's place in the hearts of tourists, although some permanent residents dislike their nineteenth-century garb and lifestyle. Most of the housing built in the last twenty-five years follows the cluster community pattern. Several research and consulting firms have located on the island, bringing with them a number of professional personnel and the beginnings of a year-round economic base. Non-depletable energy sources contribute an increasing percentage to the island's energy needs.

Paraprofessional health workers and a computer-TV diagnostic laboratory reduce the need to go off-island for medical services. Open education, increased emphasis on the fine arts and vocational training, and considerable use of closed-circuit TV are among the educational innovations.

00011

Tree of Life

Elaine Harding

This activity helps to orient students to the constant flow of time - past, present, and future. To begin the exercise talk about time and relate it to the things that the students have done, are doing now, and would like to do when they get older.

Then make a basic tree from either construction paper or with a dark magic marker. The tree should be large enough to have all the students add to it.

Following this, hand out pieces of construction paper shaped as roots. The roots are the "past." Have the students write what they have done in the past on the roots. Add the roots to the bottom of the tree thereby building a root structure. Discuss the root structure of a tree and how a human being grows.

Then do the trunk. Have students talk about what they are doing now and write these inside the trunk of the tree. Discuss the function of the trunk, and then the students present lives.

The third part of the exercise is to hand out leaves made from construction paper and have the students write some of the things that they want to do when they get older. The leaves are the future. Discuss the leaves of a tree and the possible futures of their lives. Also, you may want to describe the branches of the tree as various ways to achieve a desireable goal. Follow-up by asking what alternative means someone may use to succeed at this goal.

A variation of this theme would be to build a tree based on how their town has grown and changed, how it is now, and how it might be. The same can be done with transportation or other themes.

This activity is especially helpful for younger students because it relates the abstract concept -time- to themselves.

Gaining A New Identity - An Exercise in Personal Choice

Fran Koster

The purpose of this exercise is to create discussion on our changing concept of freedom, and its concommitant strains, and the question of choice in ones future. One relatively modern social development which has profound implications for the future lies in modern Americans ability to shift, to some extent, their identity. One can move from city to country, from town to town, from rich to poor, etc., depending on the new identity sought. For the next several years (until the food/population crunch hits the U.S. hard) your students have this range of choice.

Ask your students to pick a new first and last name which has characteristics or connotations they admire. Have them put it on a name tag, and then place it on their foreheads. Request the students to use the new identity in addressing each other. You as an instructor must do the same. Have them sign all assignments, etc. that way. If you can, have them select their seats by negotiation with others, under their new names.

After two days, (some of which you may want to tape), ask the students to recite on a voluntary basis, the reasons for their name choice, and how it felt to have a new identity. Note comments of excitement, anxiety, risk taking, etc. Try and deal with those who kept their own name by identifying the motive, which may have to do with security needs - which you can develop into a discussion of the phenomenon of "Future Shock." Explore the implications of social mobility.

Population Food and the Curricula

Cyndy Guy

A Population Curricula for Children?

As a teacher of younger students, it was always difficult to deal with issues that seemed relevant and to make them understandable and real to the children. In thinking about a series of materials a teacher could use on a unit concerning population and food distribution, there are several considerations that come to mind:

- There is little available resource material for younger children.
- Students have no experience in this area as a subject.
- Population studies include concepts that are difficult for pre-adolescent children to deal with.
- With little previous study in this area, students are especially vulnerable and easily influenced.
- This is an area that seems quite 'removed' for most children, i.e., it's on the other side of the world.
- How do you teach the dynamics of something you have never come close to experiencing, starvation?
- How do you keep from turning students off through depression in light of the overwhelming facts and projections about population, food, etc.?
- How do you be objective in light of this extremely value laden area?

I never really discovered an adequate way to deal with population issues in my fifth grade environmental studies classes and yet was convinced that it was a prime area even on this level. Innumerable studies show that an individual's first attitudes about family size are formed at a young age.

What I have done with the exercise that follows is use one of Sid Simon's values clarification exercises. It is not meant as a unit. It is merely an example of one type of activity that a teacher might try with students. A much more thorough investigation of population issues is necessary. I would suggest that a teacher might use this statement exercise after doing something like a group fast. Students would have that as a common experience from which to start their discussions about population problems.

Several further considerations concerning this exercise are that I see no need of having the students sign their name nor do I see the necessity of collecting the papers unless the teacher feels it is of vital importance to see the attitudes reflected as a class. The statements I have listed are only a partial list. There are many areas that have not been considered. If you teach older students, many of the statements can be adapted accordingly.

As a final note, I would hope that by the end of a study of population in a class, students would have learned at least two things:

1. Overpopulation throughout the world is an extremely complex problem involving many areas and it cannot be solved by concentrating on any one of these areas alone.
2. Understanding the interrelationships between these areas is of paramount importance if you hope to understand the problems related to overpopulation.

From there, the field is wide open. I would like to hear your ideas.

Food and Population
Strength of Values

SA = Strongly Agree
AS = Agree Somewhat
P = Pass
DS = Disagree Somewhat
SD = Strongly Disagree

A. Item	Response
1. Man is basically good.	
2. In general, I do not question what my teachers say.	
3. Everyone in this country should have only two children from now on so that the population will not continue to grow bigger.	
4. Americans should try and have a smaller population.	
5. Only people in countries that are poor and do not have enough food should try and have less population.	
6. We should give food to these countries even though their population keeps growing.	
7. If a person is from an 'educated' family, it is okay to have more children.	
8. More 'educated' people tend not to hurt the environment as much. They probably know better.	
9. I would be willing to give up going to MacDonald's for hamburgs if I knew it meant 20 more people my age could be fed somewhere.	
10. Since this country was founded as a Democracy, a land of the free, it is not right to make laws about how many children a family can have.	
11. We can educate people here about overpopulation in time so that we won't need to have these rules.	
12. Since it takes over 30% more resources to bring up an American baby than one from India, we should not tell other countries what to do about their population.	
13. We should give food to countries that need it even though their population keeps growing.	
14. We should only give food to starving nations when we have extra food here.	
15. We should give food to nations that need it only when we have made sure all the hungry in this country have been cared for.	
16. We should give food to other countries only if they prove they are doing something about controlling their population growth.	
17. It is important to follow what you are taught in church whatever your religion.	
18. Schools should teach students how to learn and not what to learn.	
19. The United States should give food to any country that has starving people that need to be fed.	
20. Sometimes after skipping breakfast, I find it difficult to concentrate on my school work before lunch comes.	
21. It is up to the woman in the family to decide how many children they are going to have because she is the one who has them.	
22. Even though wars are horrible maybe they are necessary because of the population problem.	
23. It is more humane to kill an animal such as a deer through hunting than to maybe let it die a slow death through starvation during the winter.	
24. We should not let people from other countries move in here because we already have too many people for the amount of land and resources.	
25. From seeing pictures in the paper and on TV of starving people, I know how horrible it must be.	
26. Maybe we have to have starvation in some countries until they 'understand' why they have to have birth control.	
27. Every family who owns a cat and (or) dog in town should only let them have a certain number of babies and there should be a law about this.	
28. Only families who have the money to feed animals well should have pets.	
29. The town should decide what to do about 'extra' animals if there gets to be too many.	
30. Since there is more crowding in the cities which presents many problems there, people in the country should have more right to larger families and more pets.	
31. Etc.	

To Continue Recieving
the FII Nesletter
fill out this..... QUESTIONAIRE

○ The Futures Information Interchange is helpful to me. Please continue to send it. (The newsletter is currently distributed free of charge to interested educators as a service of the Future Studies Program and the University of Massachusetts School of Education.)

○ If it becomes necessary to charge a small amount for FII subscriptions to cover paper, duplicating, and postage (say $2.40 per year/6 issues) I would be willing to pay.

The most helpful part of FII is...

- ○ Teaching tips and specific lesson ideas
- ○ Background articles
- ○ The future of education
- ○ Other (e.g. book reviews)

COMMENTS:

In upcoming issues which of the following approaches to teaching would you like to see more on...

- ○ games
- ○ simulations
- ○ movies
- ○ slideshows
- ○ creative arts (for visualizing the future)
- ○ other

I would like an emphasis placed on these particular subject areas....

- ○ population
- ○ food
- ○ energy
- ○ technology
- ○ resources
- ○ ecology
- ○ transportation
- ○ work
- ○ housing
- ○ land use
- ○ other

COMMENTS:

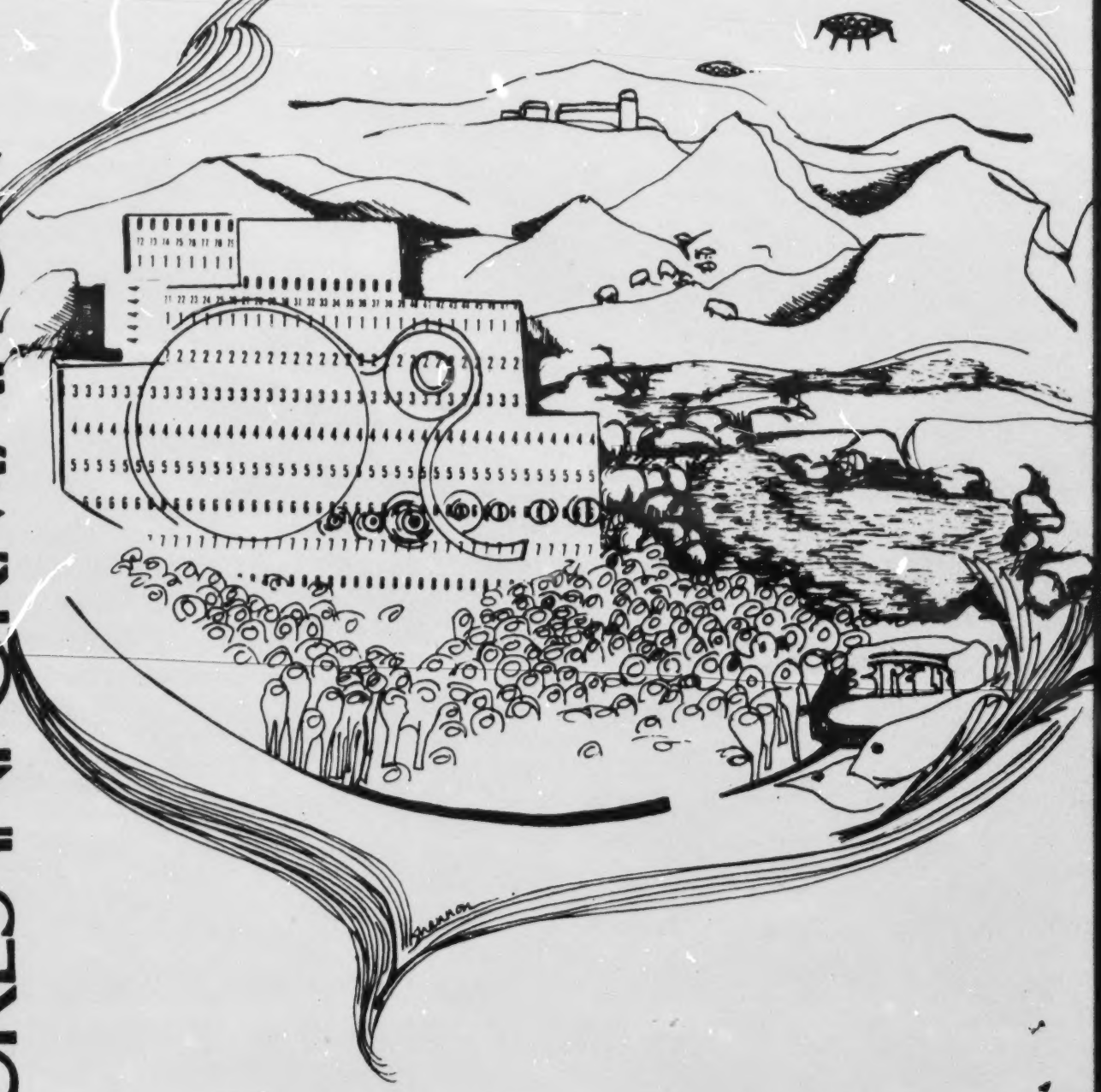
- ○ I teach grade(s)_____. Subject(s)_____.
- ○ I have been teaching futures units or/ with a futuristic slant.
- ○ I haven't yet but I am thinking about it.
- ○ I have a futures teaching idea which I could write up and send in. (We welcome contributions!)
- ○ ..... but I'll need some encouragement. Call me at_____.

00016 Name_____ Address_____

_____ Zip _____

50

INTERCHANGE



FUTURES INFORMATION

SO 008 330

Future Studies Program
School of Education • University of Massachusetts

00017

Consulting

The Future Studies Program has qualified graduate students who are available to schools, non-profit organizations and governments. They will bring educational strategies, audiovisual materials, and proven curricula upon request. Terms of employment are negotiable. For further information contact Jake Plante, Future Studies Program.

****

The Future Studies Program is searching for interested undergraduate and graduate students for 1976 admissions into the Program. Applicants should apply through the University.

****

The Futures Information Interchange Newsletter is a collection of practical teaching methods and learning activities for introducing future studies into the classroom. Although the newsletter is directed toward primary and secondary school teachers, it is intended to be of value to educators at the pre-school and university levels also. Contributions to the Newsletter: the newsletter staff welcomes any specific materials related to your future-oriented work in the classroom that you would like to interchange.

Vol. III No. 3 April 1975

Future Studies Program
School of Education Hills House
Rm. 166 University of Massachusetts
Amherst, Mass. 01002

CONTRIBUTORS:

Duane Dale	Fran Koster
Susan Fink	Al Peakes
Kristine Garvey	Jake Plante
Cyndy Guy	Beth Shannon

Marc Skvirsky

APR 21 1975

Images of the Future and Their Educational Significance

by Jake Plante

> "Previously, men studied the past to shed light on the present. I have turned the time-mirror around, convinced that a coherent image of the future can also shower us with valuable insights into today."
>
> Alvin Toffler

Images of the future are culturally and socially created from past experience and knowledge, present circumstance, and views of future events which are believed to be possible, likely, and desireable. Although the past, the present, and their extensions determine future images for the most part, creative imagination and conjecture are also contributing factors.

Images of the future are not just a neutral outcome of the socialization process but a causal force which influences events by shaping the social and psychological fabric of individuals and societies. A strong relationship exists between the images we have of the future including how we see ourself in these futures, and our "world view" and expressed behaviour. The poet Rilke said, "The future enters into us, in order to transform itself in us, long before it happens." In short, we live the present within the context of our future images.

Future imaging is a cyclical process. We study the future to understand what may occur, when, and with what force and effects. In turn we use this understanding of the future to focus and to influence the decisions and events of today. Therefore, it is not enough to "study the future." This would be comparable to sailing around the world unable to dock at points along the journey. The seasoned voyager acquires perspective from his contact with other lands and cultures just as our knowledge of the future gains value relative to its connections with the present.

Futurists have stressed the need to educate for the future, proclaiming that the coming years are likely to bring startling changes. Hence, the educational community should be preparing our children for the new society of tomorrow which they will inherit and be responsible for. "Education has taken as its primary purpose,"

00019

Nell Eurich writes, "the preparation of students for their future lives."

By comparison, futurists have not done as well in showing that a greater future time perspective and its richer images will have a substantial positive effect on life in the present. It is to this purpose and orientation, I believe, that education must primarily address itself to. For the learner this means that because spatial and temporal envisagement of future reality forms an important part of world view, that a student's images of the future will strongly influence their motivation, behaviour and learning achievement.

Understanding how future time perspective and its active counterpart, future imaging, relate to the here and now is of major significance to education. It is my contention that anticipation and imaging of the future play a much larger role in human development and behaviour than present psychological and social theory would suggest. We do know that an enhanced awareness of future possibilities gives one a greater array of present options to choose from. It also influences the manner and the intensity with which we pursue a chosen option. The important question then becomes - how much bearing does future time perspective and its images have on human development and given a theoretical understanding of the relationship, how do we then move beyond this and experimentally test the degree of influence which future imaging has on the learning process?

Although research and measurement are required serious problems may prevent the generation of reliable data. For instance, the notion of "time" is difficult enough to conceptualize much less measure or quantify. In fact there appears to be a natural polarization between time and quantification, a function connoting spatial dimensions. At the root of the problem lies the severe limitations placed upon our ability to conceptualize time by our inadequate philology of time. It is interesting to observe that the future is described mainly through the use of spatial and material metaphors such as "sailing around the world." We envision the short-term and long-term future. Furthermore, the relative unimportance of specific future dates compounds the problem of

00020

measuring the effect which future imaging has on events in the present.

Nevertheless, I do believe there are methods and approaches which could yield helpful and consistent results. The first order of business however is to determine what is "good" imaging and what is unproductive or debilitative imaging.

The goal of future imaging is to expand the time horizons of an individual or to free one from a time perspective that is constraining. Future time perspective is comprised of both temporal and spatial dimensions. The temporal element is the length of the time horizon or "forelook." Forelook involves such things as an understanding of when something is likely to occur, what is possible within a given period of time, and a realistic notion of the time it takes to accomplish something. The spatial element is the breadth of the time horizon or "outlook." Outlook is the scope or array of future possibilities and alternatives we can envision and the future images themselves.

In light of this, achieving greater sophistication of the futuring process means developing a higher quality forelook and outlook. Higher quality future images would exhibit:

a. wholeness and thoroughness

b. a degree of plausibility involving both internal consistency of image and a measure of external validity.

c. greater value explicitness, the measure of the extent to which the image is dependent upon a person's value system. A balance or combination of objective and subjective conjecture is desireable. To this end, achieving a greater awareness of the influence of personal values on future imaging is important.

d. creativeness

The need for further work in this area is evident. In recognition of this future image, we as educators can today facilitate the development of a richer conceptual approach to the present by promoting future image building and "futurizing" the various subject areas of education.

SIMULATION GAMES IN THE CLASSROOM
by Duane Dale

Teachers who have used learning games and simulations attest to their educational potential. Real-world problems and important decision-making roles, create a need for knowledge and skills which may motivate even the student who is uninspired by class discussions and the demands of tests. Some games will serve to introduce (and promote interest in) new material, while others will help to integrate a nearly-completed unit.

The problem with games is the lead time required. As with film, preview is important. And preview (pre-play) may result in rejecting a game as being inappropriate. Directories and publishers' descriptions are often inadequate. AV directors can help by reading game reviews and by sharing evaluations of other teachers. Even then, the teacher needs to learn the game, prepare materials, and to learn to be ready to answer questions. This is time-consuming but for a good game, well worth the investment.

The question then, is how to spot the good games. Fifteen University of Massachusetts education majors found one solution in a fall '74 course titled "Learning Games and Simulations." We played and reviewed 20 games, acquiring in the process a standard for evaluating the educational effectiveness of games. The five games described below were rated high; they provide a good starting point for teachers new to educational gaming.

Creating Simulations. Another way to start is with role-play type simulations, which require only a situation and a set of roles. The "Food Policy Simulation" used in the UMass course was of this type: the U.S. delegation was to prepare for a World Food Council session on famine in India. Our "Secretary of Agriculture," "Farm Bureau President," "State Department population specialist," etc., were given official documents (available from the various agencies) and copies of speeches by their real-world counterparts. The 30-minute briefing

period (to read the documents) was perhaps too realistic a simulation of the phenomenon of information overload. The discussion was heated, and the positions similar to those voiced at the Rome Food Conference last November. The same method could be adopted by teacher to a wide range of situations.

Games and the Future. Role plays have obvious potential for exploring alternative futures before they happen. The games described below are not all so obviously "futuristic." "Marbles" is a way to explore alternative social and economic futures; the Rule Makers are likely to come up with some interesting social inventions during play. "Marbles" and "BaFa" both present strange social situations, thus providing a gauge of student attitudes toward change and perhaps a fresh insight into our own culture. "Global Futures" and "Population" deal with problems which are likely to be central themes as the next few decades emerge. "Super Sandwich" underscores the importance of good nutrition--also a global problem--in a way which will interest most younger students.

Name of Game:	They Shoot Marbles, Don't They?
Description:	Players must pay a regular "subsistence" fee (1 marble) to the Game Overall Director (G.O.D.). Only the Marble Shooters have a direct way of obtaining marbles, so in order to win elections the Rule Makers have to deal with the problem of redistributing marbles. Other roles include Rule Enforcers, Judge, Opposition Party, Social Worker, Media, etc., (depending on the number of players). With only a few rules, the game simulates a complex social situation by tapping players' knowledge, attitudes, and preconceptions. The game's creators refer to it as a "frame game" because of its minimal structure.
Objectives:	Originally designed to stimulate discussion between police and juvenile delinquents, the game provides an experience base for discussions of social and economic planning as well. This game is very useful, especially in a unit on social inventions and alternative futures.
Number of players:	8 to well over 30
Age Level:	High School to adult
Access:	Gaming Extension Service, University of Michigan, Ann Arbor, Michigan (approximately $45).
Playing Time:	2 hours or more

Name of Game: BaFa-BaFa

Description: The game is divided into cultures, Alpha and Beta. Two members leave the room and the rules of the culture are shared amongst the others. The other two return and try and decode the rules of the culture.

Objectives: This game is designed to increase people's awareness of societal roles and some human traits such as greed, friendliness, helpfulness, etc. This simulation is also important for experiencing cultural differences.

Number of Players: 20 to 40

Age Level: High School to adult

Playing Time: One to two hours

Access: Simile II, 1150 Silverado, La Jolla, CA 92037. (Complete kit, or instructions for making your own)

Name of Game: Global Futures Game

Description: This game is a simulation of present and future world conditions in terms of population, food, technology, and education and the relative growth rates of each. Groups of players representing eight socioeconomic world regions barter for resources in 5-year rounds toward the year 2000. Players make collective policy decisions, make errors (reflected in world destruct points) and develop optimal strategies to make the world work for 100% of humanity.

Objectives: The purpose of the Global Futures Game is to graphically demonstrate several world problems by simulating the world's situation in terms of its population, food resources, technological resources, and their relative growth. One of the methods of solving these problems is education, making it the final variable. Players come away from the game having gained insight into the interconnectedness of global problems and the need for a cooperative effort to solve them. (Excerpts were taken from the literature put out by Earthrise written by Bill Bruck.)

Number of Players: Eight to forty-eight

Age Level: High School to adult

Playing Time: Two hour period

Access: Earthrise, P.O. Box 120, Annex Station, Providence, Rhode Island 02901, (prices range from $5.00 to $10.00).

Name of Game: Population: A Game of Man and Society

Description: Each player manages one of the six countries of the planet Celestra. Capital must be invested in agriculture, education health services, and industry, in the proper balance to support the country's population. Population growth rates are partly under the player's control. The game assumes that population growth up to a certain maximum is desirable for each country, as long as development keeps pace. International trade and resource competition are not part of the model, but planet-wide effects of one country's population overshoot are included. The game is compatible with the common developing country view that a large population will be needed for full economic development. There is no mention of a global maximum population.

Objectives: The game promotes understanding of several key concepts in population studies: 1) the need to keep population in balance with development, 2) the long lag time required to stabilize a population from a high growth rate, and 3) the type of decisions which national leaders use to shape development. (However, realistic policies for influencing rates are not modeled.)

Number of players: 2 to 6

Age Level: Junior High to adult

Playing Time: One to two hours

Access: Urban Systems, 1033 Massachusetts Avenue, Cambridge, Mass. 02138, (around $10.00).

Name of Game: Super Sandwich

Description: Players attempt to put together a "super sandwich" which must meet or surpass the RDA (recommended daily amount) of iron, calcium, vitamins, protein, etc., as well as calories. If a player goes over in calories, he or she must go to the gym. Other cards, somewhat like in monopoly, determine things such as losing calories, costs, etc. Players receive $.75 every time they go by 'Go' which is used in the purchase of meals.

Objectives: This game is designed to increase people's knowledge of the nutritional value of different foods and the value of money in buying them. It also creates an enjoyable environment for people to acquire a better grasp on how to eat a well balanced meal and to get to know daily food requirements.

Number of Players: 2 to 4

Age Level: Primarily 9 to adult

Playing Time: Two to two and a half hours

Access: Teaching Concepts, Inc., 230 Park Avenue, New York City, New York, 10017 ($12.95 - 1974 price).

850000
00025

An additional game submitted by M. K. Garvey.

Name of the Game:	Decision Makers
Description:	In "Decision Makers" the interaction between community members seeking change and those whose support is essential for a project to succeed is dramatized. The participants assume roles as residents of a typical suburban community. The group is divided in half. One group becomes Change Agents and toe other group Decision Makers. The Change Agents are a local citizens group trying to get a course "Challenges of Peace Building" introduced into the local High School curriculum. The Decision Makers represent the key elements in the community. Parents, teachers, students, school administrators, community leaders' support is needed to introduce the course for six weeks, six months or one year. A range of topics and emotions are provoked by the interaction. Not only are international issues and community change highlighted but the experience stimulates individuals and heightens a sense of personal awareness and involvement in the process of change.
Objectives:	The game simulates problems groups face when they try to gain community support for a controversial project. A teacher could easily substitute a Futures Course or other current subject of information in place of the included curriculum. This would enable a teacher to continue with the objectives of the ongoing curriculum.
Number of Players:	20 to 50
Age Level:	High School to adult
Access:	American Friends Service Committee Community Peace Action Program ($5.50) 15 Rutherford Place New York, N.Y. 10003
Playing Time:	90 minutes

000026

DELPHI

by Al Peakes

The Delphi is a tool with a two fold significance for education. Originally developed by Theodore Gordon and Olaf Helmer in the late 1940's for use in technological forecasting, Delphi has been found useful as a planning tool and a teaching technique. Though originally conceived as a device to create consensus through a repeating questionnaire issued to experts in a particular field of research, Delphis have been productively used in a plethora of circumstances.

Perhaps the most successful of these aforementioned adaptations has been the "Focus Delphi." The "Focus Delphi" differs from the pure Delphi in the following ways:

- it does not confine itself to science and technology
- it does not rely on "experts" in the narrowest sense
- it elicits needs and desires rather than forecasts
- it is not done by mail

The following guidelines will hopefully enable you to use the Delphi productively in your situation:

1) Determine Information Needed - These may include necessary skills for jobs, budget priorities, curriculum characteristics, behavioral objectives, or needs of the community.

2) Identify Delphi Panel - This would be a cross-section of people who either make or receive decisions relating to your informational objective. External experts might also be included. Clearly, this is the most important phase of the entire undertaking, as a poor or inappropriate pool may result in a pooling of ignorance or a misperception of objectives. For instance, if one were planning a vocational counseling program input from various practitioners of crafts, skills, and professions would be a useful supplement to that of all the vocational counselors in the district.

3) Design Questionnaire - This too is of critical importance. Wording can easily skew the responses. We, therefore, recommend a step-by-step approach, usually commencing with a focus question and following up with a series of specific questions relating directly to the first. Depending on the panel's familiarity with the subject matter one might

ask not merely the probable date of occurence, but also the earliest and latest date of occurence; costs, if any, inhibiting factors, enhancing factors and social impact. Such a questionnaire might look like:

	Event	Year	Cost	Inhibiting Factors	Enhancing Factors	Social Impact
1.		Earliest				
		Latest				
2.		Earliest				
		Latest				

4) Distribute Questionnaire - Questionnaire is then distributed to all members of the panel. Although not mailed, responses should be written and confidential, thereby minizing political phenomena such as authoritarianism, ageism, racism, sexism, and economic status.

5) Compile Results - Carefully edit and condense responses on inhibitng and enhancing factors as well as social impact. Then calculate the mean (average) and the median (mid-point) from the numerical data.

6) Develop Round Two - The results from the first round should be reflected in the second questionnaire with appropriate space for respondents to change their minds. Clearly, not all variables will be considered by everyone, thus responses change.

7) Continuence - Cycles may be repeated until little new data is generated. This gives you your groups' consensus. Typical Delphi results show three rounds to be sufficient.

Obviously, as a planning tool, it has weaknesses. Some people's minds work vastly different from others. What's crucial data for one person is nonsense for another. It does give you a good idea about your panel's future ideas concerning an issue, and why they think the way they do.

Delphi is also useful for classes desirous of working in the community and helping them set priorities for their work. Also a teacher might have one's students project themselves into role playing citizens of civilizations past and present, and elicit their responses based on these roles. Emphasis would obviously be put on the inhibiting and enhancing factors columns. Examples of these and other Delphis can be found in upcoming issues of "Futures Information Interchange."

ELECTRICITY IN OUR HOMES - A CURRICULUM ACTIVITY

by Cyndy Guy

Okay, you say, electric energy may be cheaper than other forms (candles) but what are the larger implications of energy usage? How much energy went into the production of the refrigerator, the vacuum cleaner, the hair dryer or light on the aquarium?

Before we investigated such questions in my fifth grade class I simply asked my students to list all the items in their homes that were run by electricity. The students eagerly started their lists. For those who had trouble remembering and as a check for the others, I suggested that they take an imaginery trip through each room to try and recall all the things that go on in them. A great flourish of remembered items were added to the lists.

Most youngsters, like adults, unfortunately think their place in society is enhanced by the number of material goods in their close possession. Comments such as the following were typical:

"How many do you have on your list?"
"You poor thing, I have 75."
"WE have 25 lights on OUR Christmas tree."
"We have an air conditioner, do you?"
"Oops, almost forgot the saudering iron."

Some students were anxious to bring their lists home so that they could be sure to get every item; others were busy copying them over so that everyone would be sure to be able to read them clearly. I requested that everyone add up the items and put the total down somewhere on the paper. Following this I asked my students to go down through their lists and place a color or symbol next to any items they felt they simply could not do without. After this they were to create another symbol and put it next to any items they 'could' do without and another for any items they could easily do without.

Lively conversation, controversy and alterations concerning categories took place throughout the rating. Some of the most active boasters started looking a bit perplexed as they looked over their totals a little less certain of their stands. Upon completion of this exercise we had a general discussion about electricity, where and how it originates and whether we represent typical American families in our usage. My students who enjoyed working with numbers

offered to total up the items on all the lists in the class and use this as a rough scale for all the classrooms in the school. They later obtained population statistics for the town, state and nation and were able to give the class figures on how many electric items 'could' possibly be in use. Needless to say the numbers were overwhelming.

Although I used this activity as a springboard for explorations in class concerning the possible futures of their community similar versions could be used in many other ways by a creative teacher. If there is a social studies unit in progress concerning another country (even if there isn't) students could compare the number of electric items in a typical home there and compare them with the average American household. If this happens to be a Third World country the contrast could be staggering. Discussions and activities could follow concerning this discrepancy and the 'rights' of one country over another to possess this vast amount of materialism with obvious energy and ecological implications for all mankind. High school students might calculate in more scientific terms exactly what this means in terms of energy usage and what possible futures are in store if the trend continues. What other systems are becoming jeopardized, what scenarios could be drawn up and most important, what alternatives are there?

I used electricity as a vehicle for getting into a unit but the same kind of idea can be applied in many different ways. For example students might list all the various kinds of systems for locomotion and then analyze what they mean and compare their effects with methods used elsewhere in the world or in the past. The important thing to remember is that this singular activity is not a unit. It is one type of thing that can be done <u>within</u> a unit. It would be unfair and non-educational to have the electricity lists completed and the activity dropped with a minimum amount of integration into other work and the lives of the students. What are the overall implications of all the items and resultant energy use within our households? Hopefully at the end of our inquiries we'll be in a better position to justify the electricity (or whatever the subject) we do use and will decide that other uses cannot be justified. For an elementary school age student this is a start.

Key: (+) cannot do without, (-) could do without, (*) could easily do without.

Electric Appliances
by
Scott Lincoln

Item	No.	Code	Item	No.	Code	Item	No.	Code
Lamps	7	(-)	Sewing Machine	1	(-)	Hedge Trimmer	1	(*)
Clocks	3	(+)	Telephones	2	(+)	Train Set	1	(+)
Vacuum Cleaners	3	(-)	Garbage Disposal	1	(+)	Toaster	1	(-)
Refrigerators	2	(-)	Washing Machine	1	(*)	Razor	1	(+)
Elect. Football Set	1	(+)	T.V.	1	(-)	Stove	1	(+)
Elect. Blankets	2	(-)	Dryer	1	(*)	Coffee Pots	2	(+)
Oven	1	(+)	Saws	2	(*)	Dishwasher	1	(-)
Lights	19	(+)	Drills	2	(*)	Deepfat Fryer	1	(-)
Tape Recorders	2	(+)	Christmas Lights	50	(+)	Fish Pump	1	(*)
Humidifier	1	(+)	Record Players	2	(+)	Red Light/stove	1	(-)
Fans	3	(*)	Slide Projector	1	(-)	Outlets	38	(+)
Mixers	2	(-)	Radios	3	(-)			

Electrical Items in My House
by
Monica Gagnon

Item	No.	Code	Item	No.	Code	Item	No.	Code
Refrigerators	2	(+)	Freezer	1	(+)	Washer	1	(+)
Oven	1	(+)	Elec. Leg Shaver	1	(+)	Dryer	1	(+)
Dishwasher	1	(+)	Elec. Toothbrush	1	(-)	Shaver	2	(+)
Elec. Knife	1	(-)	Hair Dryer	1	(*)	Water Pik	1	(-)
Hot Plate	3	(-)	Elect. Hair Set	1	(+)	Organ	1	(*)
Coffee Pot	1	(*)	Elec. Mirror	1	(-)	Iron	1	(+)
Mixer	2	(+)	Telephones	2	(+)	Ele. Scissors	1	(*)
Canopener	1	(+)	Radios	3	(+)	Elec. Saw	1	(+)
Toasters	2	(*)	Clocks	3	(+)	Car Heater	1	(+)
Ice Crusher	1	(*)	Televisions	4	(+)	Snow Blower	1	(-)
Lights	29	(+)	Elec. Games	3	(-)	Sabre Saw	1	(*)
Lamps	31	(+)	Movie Projector	1	(-)	Air Conditioner	1	(+)
Record Players	2	(*)	Turkey Cooker	1	(-)	Battery Charger	1	(+)
Humidifier	1	(+)	Elec. Sander	1	(+)	Door Bells	2	(*)
Dehumidifier	1	(*)	Christmas Lights	4	(+)	Work Light	1	(+)
Stereo	1	(-)	Elec. Candles	4	(*)	Elec. Blankets	3	(+)
Vacuum Cleaners	5	(+)	Drill	1	(+)	Light Bar	1	(+)
Fans	3	(+)	Vaporizers	2	(+)	Soldering Gun	1	(+)
Washer	1	(+)	Night Lights	8	(+)			

F8000

THE ENERGY CRISIS, FUTURISTICS AND DECENTRALIZATION

by Fran Koster

Many teachers of Future Studies have been attempting to use the energy crisis as a useful issue around which to discuss the future. After one plows through endless newspaper articles about the diminishing supply of natural resources, and listens to the many conflicting claims from corporations about the safety of nuclear power or the anticipated technological breakthrough in coal gassification, it comes as a real relief to be able to find books which set all these issues aside and talks about the personal alternatives.

Handbook of Homemade Power	$1.95, Bantam
Producing Your Own Power	$8.95, Rodale Press
Solar Science Projects for the Classroom	$ .75, Scholastic Book Services

The Mother Earth News Handbook of Homemade Power is subtitled "Alternative Energy Sources You Can Put to Use Now". It is selling for $1.95 (Bantam Books). The importance of this book lies in the fact that it covers the entire range of decentralized energy systems starting with old means of producing heat (such as wood stoves) and goes on to include the use of windmills, solar power, and methane gas. Simply written, it describes the technology of alternative energy sources in a language that students can understand and provides enough detail that they can replicate the the projects in the classroom. Included are working diagrams of how to build a solar oven, a solar hot water heater, solar home,

heating, and also how to make a small scale model methane digester that will actually run a Bunsen burner.

For faculty members or others who are interested in pursuing any of the subjects covered in the book, there is a 13-page bibliography which is excellent.

Producing Your Own Power is a technical cut above the Handbook. Full of blueprints, technical specifications, and a more sophisticated writing style, the range of alternatives covered is excellent. Suitable for high school aged students or older. The contributors are nationally known experts.

Solar Science Projects (formerly Fun with the Sun) is suitable for junior high and high school students. It contains clear directions on how to make focusing reflector cookers from aluminum foil, solar stills using simple carpentry, solar furnaces, solar ovens, solar water heaters, and solar motors. Written very simply, it furnishes little philosophic or economic rationale, but does show "how to do it."

One useful way to utilize these books would be in coordination with the materials available free from the Energy Conservation Corps, Bolton Institute, 1835 K Street, Washington, D.C. 20006. The kit they provide is an excellent introduction to the world energy story, personal energy use study, and some terse set of options.

Taken as a package, these materials will provide an excellent short course on energy options for a decentralized, low technology society.

INTRODUCTORY BIBLIOGRAPHY FOR FUTURE STUDIES

GENERAL

Beitz, Charles and Micheal Washburn. Creating the Future. New York: Bantam Books, 1974.

Boulding, Kenneth. The Meaning of the 20th Century. New York: Harper Colophon Books, 1964.

Brown, Lester. Not By Bread Alone. Springfield, Mass.: Praeger Publishers, 1974.

Clarke, Arthur C. Profiles of the Future. New York: Bantam Books, 1972.

Chase, Stuart. The Most Probable World. Penguin Books, 1969.

Kahn, Herman. Thinking About the Unthinkable. New York: Discus Books; Avon Publishers, 1971.

Toffler, Alvin. Future Shock. New York: Random House, 1970.

Toffler, Alvin (ed.). The Futurists. New York: Random House, 1972.

Tugwell, Franklin. Search for Alternatives. Cambridge, MA: Winthrop Publishers, Inc., 1973.

ECONOMICS, POLITICS, SOCIETY, AND INTERNATIONAL

Baier, Kurt and Nicholas Rescher (eds.). Values and the Future: The Impact of Technological Change on American Values. New York: The Free Press, 1970.

Barraclough, Geoffrey. The Great World Crisis I. New York Review of Books, January 23, 1975 (article).

Best, Fred. The Future of Work. Englewood Cliffs, New Jersey: Prentice-Hall, 1973.

Dubos, Rene. So Human an Animal. New York: Scribners, 1968.

Ehrlich, Paul R. and Anne H. Ehrlich. Population, Resources, Environment: Issues in Human Ecology. San Francisco, Calif.: W.H. Freeman & Co., 1970.

Ehrlich, Paul R. The Population Bomb. New York: A Sierra Club/ Ballantine Book, 1971.

Hall, Edward T. The Silent Language. New York: Doubleday, 1959.

Herber, Lewis and Murray Bookchin. Post-Scarcity Anarchism. Berkeley, CA: Ramparts Publishers, 1971.

McHale, John. World Facts and Trends. New York: Macmillan, 1972.

Meadows, D. et, al. The Limits to Growth. New York: Universe Books, 1972.

Weisberg, Barry. Beyond Repair: The Ecology of Capitalism. Boston, MA: Beacon Press, 1971.

00034

SYSTEMS AND SIMULATIONS

Abt, Clark C. Serious Games. New York: Viking Press, 1970.

Laszlo, Ervin. The Systems View of the World. New York: George Braziller, 1972.

Platt, John R. The Step to Man. New York: John Wiley & Sons, 1966.

Zuckerman, David W. and Robert E. Horn. The Guide to Simulation Games for Education and Training. Cambridge, MA: Information Resources, 1970.

APPROACHES TO FORECASTING

Ayres, Robert V. Technological Forecasting and Long Range Planning. New York: McGraw-Hill, 1969.

Farrell, Edmund J. Deciding the Future: A Forecast of Responsibilities of Secondary Teachers of English 1970-2000 A.D. Urbana, Illinois National Council of Teachers of English, 1971.

Norman, Maxwell, Dimensions of the Future Alternatives for Tomorrow. New York: Holt, Rinehart, & Winston, Inc,, 1974.

Watt, Kenneth E.F. The Titanic Effect. Stamford, Ct: Sinaver Associates, Inc. Publishers, 1974.

SCIENCE FICTION

Asimov, Issac. Foundation Trilogy. New York: Avon Books, 1951.

Brunner, John. Stand on Zanzibar. New York: Ballantine Books, 1968.

Frank, Herbert. Dune. New York: Ace Books, 1965.

EDUCATION

Ivany, George T.W. (ed.). Environmental Readings for Teachers. Reading, MA: Addison-Wesley Publishing Co., 1972.

Leonard, George B. Education and Ecstacy. New York: Dell Publishing Company, 1968.

Marien, Micheal. Alternative Futures for Learning: An Annotated Bibliography of Trends, Forecast ,and Proposals. Syracuse, New York: EPRC, Syracuse Univ. Research Corp., 1973.

Muller, Herbert J. Uses of the Future. Bloomington, Indiana: Univ. Press, 1974.

Postman, Neil and Charles Weingartner. Teaching as a Subversive Activity. New York: Dell Publishing Co., 1968.

Scott, John Anthony. Teaching for a Change. New York: Bantam Books, 1972.

Toffler, Alvin (ed.). Learning for Tomorrow: The Role of the Future in Education. New York: Random House, 1974.